



United States
Department Of
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Forest
Service

Shasta-Trinity National Forests
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Reply To: 3420

Date: March 29, 1990

Subject: Evaluation of Condition of Identified Rust Resistant Sugar Pine,
Upper Lake RD, Mendocino NF (FPM Report No. N90-3)

To: Forest Supervisor, Mendocino NF

Forest Botanist Dave Isle noticed some unusual swellings on the branches of identified Rust Resistant Sugar Pine (RRSP) number 11300 on the Upper Lake RD. He was concerned about a possible threat to the health of the tree. The tree and surrounding stand were evaluated on February 28, 1990 by Dave Schultz from the Forest Pest Management Northern California Service Area, accompanied by Nancy Gard from the Upper Lake RD, and Dave Isle.

The identified RRSP was a mature tree with noticeably thin foliage. The elevation was 3,000-3500 feet, and the surrounding stands were generally comprised of Douglas-fir, sugar pine, and ponderosa pine, with an understory of live oak and madrone. The area immediately surrounding the identified tree had been thinned in the past, although several Douglas-fir and sugar pine trees were still close enough to make crown contact.

There did not appear to be any signs of infestation by bark or cambial boring insects on the bole of the identified RRSP, or any of the adjacent sugar pines. The swellings on the branches of the identified RRSP were the result of boring by a pitch nodule moth, Petrova spp. Some of the points of attack by the pitch nodule moth seem to have originated at oviposition sites on the twigs caused by cicadas. Other cicada oviposition sites on twigs had not been attacked by pitch nodule moths, but the sites remain an open wound for several years before healing over. Normally, both pitch nodule moth attacks and cicada oviposition injuries are rarely abundant, and both rarely cause serious injury except in small diameter seedlings, where attacks may contribute to physical breakage.

The current situation is unusual because both cicada oviposition injuries and pitch nodule moth attacks are very abundant on sugar pines in the area. While each attack would not be expected to have much effect on the trees' health, the cumulative effect of many attacks would be to reduce vigor. There are other factors present which would also reduce tree vigor. Most of the sugar pines in the area have a light to moderate infestation of the pine needle scale, Chionaspis pinifoliae. Normally, scale infestations would be expected to produce only a slight reduction in vigor and growth. The major stress factor in the area is low available soil moisture caused by four consecutive dry winters. The combination of stress factors has resulted in visible symptoms of low vigor in many overstory sugar pines and other conifers in the area. Low needle retention and off-color foliage were common in overstory trees. Recent mortality of a number of conifer species was present throughout the area.





vegetation around an identified tree will reduce the total demand on soil moisture and will increase the amount of moisture available to each leave tree. Some additional protection can also be given to an individual pine by removing other pines within about 20 feet of the identified tree. This will reduce the probability of having the identified tree included in a bark beetle group kill. If a pine comes under attack by mountain pine beetle, a pheromone will be released which will attract additional mountain pine beetles to the area. The concentration of beetles drawn toward the tree under attack may be able to overcome additional healthy pines in close proximity. If it is vital to leave other pines within 20 feet of an identified high-value pine, they should be vigorous, healthy dominants or codominants which have a low probability of being attacked by bark beetles. Because thinning can result in physical site disturbance, and may also alter growing conditions by increasing sunlight and temperature, there may be a temporary increase in stress on leave trees. For this reason, it would be prudent to defer thinning around high-value trees until moisture conditions have returned to normal.

MANAGEMENT ALTERNATIVES

1. Do nothing. A general increase in tree mortality is anticipated on the Mendocino NF during 1990. The identified RRSP examined has signs which indicate the tree is under stress. The identified tree would be expected to have an above average probability of being killed during the next year. As with all statements based on probabilities, it is also possible that the tree will survive, even if no action is taken.
2. Water trees. Supplemental watering of forest trees in California has been done a few times under campground conditions, and to protect special plantings. It requires a commitment of time and some equipment. Previous projects which were sustained through the growing season have resulted in very high survival of the watered trees.
3. Protect trees with insecticide. A single application of carbaryl to the basal 35 feet of the bole will protect pines from attack by Dendroctonus bark beetles for up to 18 months. This type of treatment has been over 80% effective in experiments where the trees were exposed to heavy attack pressure by bark beetles. Carbaryl treatments have been 100% effective in preventing mortality in operational treatments of pines which were stressed by drought or fire scorch. When trying to protect an individual high-value pine, it would be prudent to also treat all other pines over 5 inches dbh which are located within a radius of about 20 feet. The cost of the carbaryl would be about \$1 to \$10 per tree, depending on the diameter of the tree. The greatest variable in the total cost is labor.
4. Thin surrounding vegetation. A reduction of biomass around an identified high-value tree will increase the amount of moisture available to the tree. This should increase vigor and improve resistance to bark beetle attack. Removal of all other pines within 20 feet of a high-value pine would reduce the chance that the high-value pine could be killed as part of a bark beetle group kill. Thinning, or other activities which disturb the site, can temporarily increase stress on the leave trees. The greatest long-term benefits from thinning would be obtained by waiting until precipitation returns to normal before making major changes in the stand structure.





Alternatives 2, 3, and 4 are not mutually exclusive. They can be used in various combinations to prolong the lives of the identified RRSP trees, or other high-value pines located on the Forest. If you want to discuss the alternatives, or need more information, please call Dave Schultz at (916) 246-5087.

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